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# COMMUNITY CONTRIBUTIONS TO SCHOLASTIC SUCCESS

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*The authors examine the influence of neighborhood characteristics on the academic outcomes of children in middle childhood. Prior research has examined structural features of the community and has evaluated their associations with youth outcomes (Brooks-Gunn, Duncan, Klebanov, & Sealand, 1993; Kowaleski-Jones, 2000). Other research has related perceptions of community environment to youth development (Aneshensel & Sucoff, 1996). This work seeks to bridge these two streams of research by considering the influence of both objective and subjective measures of the community environment on school-aged children.*

*Data are drawn from the 1990 Census and the 1997 Panel Study of Income Dynamics Child Development Supplement (PSID-CDS). Results indicate a negative influence of living in a community with low socioeconomic resources for academic achievement. In contrast, in some models, results suggest a positive role for living in a community rich in immigrant concentration for school-related behavioral adjustment and achievement outcomes.* © *2006 Wiley Periodicals, Inc.*

## INTRODUCTION

Researchers and policy makers have been interested in understanding the ways in which neighborhoods influence children. Prior research has examined the associations between structural (i.e., Census-based) features of the community and youth outcomes

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(Brooks-Gunn et al., 1993; Kowalcski-Jones, 2000). Other research has related perceptions of community environment to measures of youth problem behavior (Aneshensel & Sucoff, 1996). Our goal is to bridge these two streams of research by examining the role that both structural measures and parental perceptions of neighborhood quality play in shaping scholastic success.

## BACKGROUND

Recently, scholars have employed a positive youth development perspective in research addressing the well-being of children, acknowledging that youth should be seen as important potential resources (Lerner, Almergi, Theokas, & Lerner, 2005; Roth & Brooks-Gunn, 2003). This perspective suggests that features in a child's environment act as either internal or ecological assets in promoting healthy development (Benson, 2002). Internal assets could involve a youth's own social competencies, such as self-esteem and positive values. Ecological assets, in contrast, are features of a youth's larger social environment and could range from family support to empowerment in the community that is mobilized toward setting boundaries and expectations for youth. A body of research has examined how youth have responded to these assets and has found that positive adolescent perceptions of their communities predict positive youth outcomes (Theokas et al., 2005). The current study uses both Census-based measures and parental perceptions to capture ecological assets in the child's environment.

## STRUCTURAL CHARACTERISTICS OF NEIGHBORHOODS

In recent years, several researchers have tested the power of community-level assets, or investments in children, by examining the associations between Census-based neighborhood measures and the development of children. A consistent finding is that the number of affluent, or high socioeconomic status (SES), neighbors in a Census tract is the most important neighborhood factor predicting positive child outcomes (Brooks-Gunn et al., 1993; Chase-Lansdale, Gordon, Brooks-Gunn, & Klebanov, 1997).

An important recent stream of research examining the influence of neighborhoods on children comes from the Moving to Opportunity (MTO) randomized housing-mobility experiments. The experimental design of MTO, in which a random group of families is given vouchers to move from high-poverty to low-poverty neighborhoods, disrupts the link between family residential preferences and adolescent outcomes, and helps to overcome issues of selection bias present in previous studies. It is important to note, however, that data from randomized experiments, such as MTO, are only generalizable to low-income residents of housing projects; it is not clear whether the results translate to other groups of children. Orr et al. (2003) trace the movement of children from high-poverty to low-poverty neighborhoods in the complete sample of five MTO sites[1] and show no significant effects of changing residential settings on academic achievement, suggesting that this may be because the quality of children's schools did not improve substantially. In contrast, Leventhal and Brooks-Gunn (2004) found that, for boys in the New York City MTO site, moving to low-poverty neighborhoods is associated with higher test scores 2 1/2

[1]The five MTO sites were Baltimore, Boston, Chicago, Los Angeles, and New York.

years after moving. Further analysis, however, found that these results were not sustained at the 5-year follow-up (Leventhal, Fauth, & Brooks-Gunn, 2005). Finally, Ludwig, Duncan, and Hirschfield, (2001) examined data from the Baltimore MTO site and found that moving to a low-poverty neighborhood was associated with improved academic outcomes for younger children, but not for teens, at $2^1/_2$ years postmove. Thus, the MTO studies provide evidence of a complex relationship between residential location and academic success.

Using data from the Child Development Supplement of the PSID (PSID-CDS), which is the data used in the current study, Turley (2002, 2003) examines the influence of neighborhood factors on three specific measures of youth competence: positive self-regard, behavior, and test scores. Turley's (2002) results suggest that relative disadvantage (the income gap between children and higher income neighbors) has a beneficial effect on all three outcomes, suggesting that affluent neighbors serve as assets for children. Other work by Turley (2003) focuses on race differences in the influence of neighborhood income on children and finds that White children benefit when average income in a neighborhood increases, whereas African American children only do so when living in predominantly African American neighborhoods.

## PARENTAL PERCEPTIONS ABOUT COMMUNITIES

In addition to examining structural factors of the neighborhood, measured with Census data, this study also tests whether parental perceptions of the neighborhood have independent effects on child well-being. We focus specifically on parental perceptions of community cohesion and perceived social control.

In doing so, we build off the work of Sampson, Morenoff, and Earls (1999), who have pointed to the importance of shared connections, or social cohesion between adults and children in the community, and who also emphasize informal social control of children. Sampson et al. (1999) focus on survey-measured aspects of community social control and cohesion, while Sampson and Raudenbush (1999) data collection efforts were at the community level, including systematic social observations involving block-by-block videotaping, and analyses of school, police, court, and other agency records. In contrast, the current study focuses on parental perceptions of these aspects of the community.

Theory suggests that perceptions of the community can play an important role in influencing children's academic outcomes. Burton, Price-Spratlen, and Spencer (1997) and Spencer (2001) note substantial within-neighborhood variability in perceptions of neighborhood quality. Spencer suggests that conceptualizations of neighborhood effects must consider individuals' perceptions of their environments, as it is these perceptions that influence behavioral outcomes. The implication is that the impact of neighborhoods on children may be misestimated if we neglect how it is subjectively processed and interpreted by either the children or their parents.

A limited body of research has related perceptions of neighborhood cohesion or control to child well-being. Spencer, Cole, Jones, and Swanson (1997) fail to find linkages between youth perceptions of neighborhood cohesion and behavioral adjustment. When examining the effects of average neighborhood income on outcomes for African American children, Turley (2002) finds that the benefits for African American children emerge only when the parents of these children know at least 15 other neighborhood children by name, which is a measure of neighborhood cohesion. Finally, Furstenberg,

Cook, and Eccles (1999) show that parental perceptions of high levels of social cohesion and social control result in parental willingness to invest in local institutions and services for youth in the community.

Our work extends this previous research. We test the hypothesis that neighborhoods affect youth outcomes via structural neighborhood conditions and through parental perceptions of the neighborhood. Most previous studies have only focused on one or the other of these factors. In doing so, we aim to better explain the influence of a child's expanded social world on their competence in school domains.

## METHODOLOGICAL ISSUES

Research on the effects of neighborhoods must be concerned with the problem of potential selection bias. The process by which families select themselves into different neighborhoods might, in some unobservable way, bias estimates of neighborhood effects. More motivated parents may choose better communities and be more motivated to promote positive child outcomes.

One possible way to address this problem partially is to include a wide variety of family background measures as controls when using neighborhood characteristics to predict children's outcomes, with the hope of capturing factors that might influence both residential choice and respondent outcomes. It remains an open question if enough covariates can be introduced into the analyses to account for all possible selection factors. Vartanian and Buck (2003) compare results from traditional ordinary least square (OLS) analyses to those using sibling models that control for all measured and unmeasured family characteristics. They find that estimates of neighborhood variables from OLS models differ little from the fixed-effect estimates. Their interpretation of the results is that perhaps the models that control for a wide range of observable family and other influences may adequately address the selection of families into different neighborhoods. However, this argument cannot be tested conclusively by the authors' data.

In this article, we follow the approach of Ginther, Haveman, and Wolfe (2000) in using an extensive set of neighborhood variables to describe the characteristics of narrowly defined residential areas (Census tracts containing approximately 4,000 individuals). A series of regression models are run in which individual and family characteristics are introduced in steps, starting with the most exogenous characteristics, and ending with those that may be confounded with the neighborhood itself. We more specifically discuss our expectations for the inclusions of various controls in the Methods section.[2]

## DATA

We use the 1997 Child Development Supplement to the Panel Study of Income Dynamics (PSID-CDS). Since 1968, the PSID has followed and interviewed annually a nationally representative sample of about 5,000 families. In 1997, the PSID supplemented its core data collection with data on parents and a maximum of two of their children ages 12 or

[2]We also follow the approach of Turley (2003) and examine whether the effects of neighborhood characteristics are stronger for children who have lived in the neighborhood for a longer period of time, which would suggest that it is something about the neighborhood itself, rather than families who chose to move to a certain neighborhood, that is driving the results.

younger. The supplement includes assessments of the cognitive, behavioral, and health status of 3,500 children. One of the strengths of the CDS-PSID is its link to multiple years of data on the children's parents. We use data on children aged 6–12 ($N = 1{,}777$).

## MEASURES

All of the measures used here have been standardized to have a mean of zero and a standard deviation of one. The advantage of this practice is that it enables us to compare across models and across dependent variables with coefficients in a common metric.

## DEPENDENT VARIABLES

The dependent variables used in these analyses represent two important dimensions: test scores and classroom behaviors. Neither test scores nor behavior alone paints a complete picture of how a child is doing academically, but together these dimensions provide a fuller picture of a child's academic development.

### *Test Scores*

We use math and reading test scores, which come from the Woodcock–Johnson Psycho-Educational Battery—Revised (WJ-R), and are computed by the staff at the Panel Study for Income Dynamics. The WJ-R is a well-established measure that provides researchers with information on several dimensions of intellectual ability, including current developmental status, degree of mastery in reading and mathematics, and group standing; it has been used by a variety of other scholars to represent academic achievement (McBride, Schoppe-Sullivan, & Moon-Ho, 2005; Shin, 2004).

The Woodcock–Johnson test, as operationalized in the PSID-CDS, contains four subtests that measure different aspects of academic achievement. The four subtests are Applied Problems (capturing mathematical reasoning), Calculation (measuring computational skills), Letter-Word (identifying letters and words), and Passage Comprehension (understanding written passages). As described in Mather (1990), the Applied Problems and Calculation tests are averaged to create a measure of Broad Reading Achievement. The Letter-Word and Passage Comprehension tests are averaged for a measure of Broad Math Achievement. These same measures, Broad Reading and Broad Math, are used in Orr et al. (2003)'s study of the MTO project.

### *Classroom Behavior*

Two other outcome variables, classroom language adaptiveness and classroom disruptiveness, tap dimensions of classroom behavior. The classroom language adaptiveness scale consists of items derived from teacher's reports of how children use language in the classroom (eight items; examples are: instructs peers, communicates stories to peers, rephrases questions, is easily understood, and is a good listener). These items were adapted for use in the PSID-CDS from a larger index, called the *Adaptive Language Inventory* (ALI), which was developed to understand the links between poverty and children's language

development (Feagans & Farran, 1982). The ALI has been found to be correlated with reading scores (Feagans, Fendt, & Farran, 1995). However, we know of no other study that has related neighborhood quality to children's language use in the classroom.

The classroom disruptiveness scale consists of items from the Achenbach Behavior Problem Index that were asked of the child's teacher (five items; examples are: academic underachiever, goes through the motions, makes excessive demands, acts up in class; Achenbach & Edlebrock, 1981). These items are specifically designed to elicit information from teachers about impulsive classroom behaviors.

Pearson alpha for classroom language adaptivity was .96, for classroom disruptiveness, .84. We expected classroom language adaptive behavior to be positively related to other positive behaviors, and negatively related to behavior problems. An examination of correlations indicates that classroom language adaptivity has a .18 bivariate correlation with a measure of child positive behaviors, and a negative correlation with both externalizing and internalizing problems (–.20 and –.12, respectively). We also expected classroom disruptiveness to be negatively related to other positive behaviors and positively related to behavioral problems. Results show that classroom disruptiveness has a –.29 correlation with positive behaviors, and significant positive correlation with externalizing and internalizing behaviors (.35 and .15, respectively).

## NEIGHBORHOOD CONTEXT

### *Census Factors*

Our key independent variables of community resources and risk factors are measured, at the Census-tract level, with several characteristics abstracted from the 1990 Census. An average Census tract consists of approximately 4,000 individuals. Although this is likely to be larger than what people imagine when they think of their "neighborhood," it is a level of measurement typically examined when using nationally representative data (see Brooks-Gunn, Duncan, & Aber, 1997). Information about a Census tract was merged to the PSID-CDS geocoded data. Although most work suggests that the presence of high-SES neighbors is a key predictor of child success, a consensus currently does not exist on other important Census-based predictors. Accordingly, this research utilizes several measures of community characteristics, allowing us to compare the influence of each. We followed the methodology of Duncan and Aber (1997) and performed a principal components analysis on the same Census measures originally considered in Duncan and Aber's article to create indexes of community characteristics that may be important predictors of youth well-being.

To derive neighborhood factors, individual items were first calculated from raw Census data (for example, the percentage of Black households equals the number of Black households divided by the number of households in the neighborhood). These were then subjected to a principal components analysis with a varimax (orthogonal) rotation. In these analyses, we selected factors that had eigenvalues above point one, using the Kaiser criterion as a guide. The principal component analysis revealed six factors with eigenvalues over one, including two additional factors that are not considered here: percentage of youth and concentration of unemployment. Initial models indicated that these factors were not correlated with any academic outcomes. Additionally, analyses including all six factors did not change the pattern of results presented here. In the interest of parsimony, we elected to focus on the four neighborhood factors described below.

The factors used in this analysis are: (a) Race/family structure:[3] consisting of the percentage of families with children which are female-headed, percentage of individuals that are non-Latino Black, percentage of non-Latino White individuals (reverse-coded), percentage of families with children living as subfamilies, ratio of two-parent families with children relative to total number of children (reverse-coded); (b) low SES: consisting of the percentage of individuals with a college degree (reverse-coded), percentage of individuals in executive or professional occupations (reverse-coded), percentage of families with income greater than $50,000 (reverse-coded), percentage of individuals older than 24 years of age with exactly 12 years of education; (c) residential instability: consisting of the percentage of rental units, the percentage of units in structures with five or more units, the percentage of individuals age 5 or more who lived in the same house 5 years ago (reverse-coded); and (d) immigration: consisting of the percentage of foreign-born and the percentage of individuals of Latino descent. Descriptive statistics for the factors are presented in Table 1.

### *Parental Perceptions*

We also use two measures of parental perceptions of the neighborhood, each asked of the child's primary caregiver (typically the mother). Although some researchers have combined measures of social control and cohesion to create one larger measure (Sampson, Rausenbush, & Earls, 1997), the correlation between these measures in these data is modest (.25), suggesting that it is important to consider each dimension separately.

*Social Control.* This measure consists of eight items, measured on a scale of 1 (*very likely*) to 4 (*very unlikely*), which were summed to create a single measure. The eight items capture responses to the following questions: How likely is it that a neighbor would do something if (a) someone was breaking into your home, (b) trying to sell drugs to your children, (c) there was a fight in front of your house, (d) your children were getting in trouble, (e) a child was disrespecting an adult, (f) a child was playing with matches, (g) a child was painting graffiti, or (h) a child was stealing something. These items are combined in a scale with an alpha of .93. This measure of social control was adapted for the PSID-CDS from Elliott et al. (1996), who used identical items with data collected in both Chicago and Denver and found that these items, which they used as part of a larger index of social control, mediated the influence of neighborhood disadvantage on adolescent prosocial behavior (such as grades in school and personal efficacy).

*Cohesion.* This measure consists of three items asked of a child's primary caregiver: How many good friends live in the neighborhood, how many adults in the neighborhood do the parent talk to regularly, and how many children or teenagers in the neighborhood they know by name. To minimize the impact of high responses, these figures were log-transformed and were then standardized and summed into a single measure of cohesion.

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[3]In general, this factor encompasses diversity in both family structure and in ethnic background. It captures dimension of ethnic diversity by accounting for the African American population in a given Census tract. Family diversity is accounted for with items that differentiate between children living in single-parent families from children living in two-parent families, as well as accounting for whether children are living as subfamilies, which are formed when grown children move back to their parents' home with their own children or spouse.

***Table 1. Weighted Means for PSID-CDS Children Aged 6–12 (N = 1,777)***

| *Variables* | *M* | *SD* |
|---|---|---|
| Measures of scholastic success | | |
| Math achievement | 0.28 | 0.79 |
| Reading achievement | 0.28 | 0.81 |
| Classroom language adaptivity | 0.03 | 0.91 |
| Classroom disruptiveness | 0.03 | 1.02 |
| Neighborhood characteristics | | |
| Race and family structure | –0.01 | 0.91 |
| Low socioeconomic status | –0.01 | 0.84 |
| Residential mobility | –0.06 | 0.76 |
| Immigration concentration | –0.02 | 0.94 |
| Parental perceptions of neighborhood | | |
| Social cohesion | 0.08 | 0.69 |
| Social control | –0.01 | 0.59 |
| Individual characteristics | | |
| Age of child in 1997 | 9.05 | 2.01 |
| Child is male | 0.50 | 0.50 |
| Non-White ethnicity | 0.55 | 0.50 |
| Log of average income | 10.28 | 0.92 |
| % of child's life parents married | 0.60 | 0.42 |
| Maternal education | 12.60 | 2.54 |
| Maternal depression | 16.55 | 4.67 |
| Moved neighborhoods for child | 0.51 | 0.40 |
| Percent of child's life that parents owned a home | 0.49 | 0.41 |

These items are combined in a scale with an alpha of .79. This measure was also adapted from Elliott et al. (1996), who used these items as part of a larger measure of social integration, which was predictive of higher levels of prosocial competence among adolescents in Denver and Chicago.

Some simple correlational analyses were performed to explore the predictive validity of these measures. Results (not shown) found that parental perceptions of cohesion and control were positively correlated with parents' reports of their ability to discern strangers in their neighborhood, parents' overall rating of the neighborhood as a good place to raise children, and parents' agreement with the statement that "it is safe to walk around in this neighborhood."

It is important to note that when parents in the PSID-CDS were asked about their perceptions of their neighborhoods, they were not asked specifically to think about their Census tract; therefore, their perceptions of the neighborhood may reflect a different geographic area than the Census-based measures described above. To examine this further, data on parental perceptions of the size of their neighborhood were examined. Parents were asked, "What do you consider to be your neighborhood?" Responses indicate that almost 67% view their neighborhood to consist of the block that they live on plus up to several adjacent streets. This is an area that is typically quite a bit smaller than the physical area represented by the Census tract, the level at which the neighborhood factors are measured. Thus, our results, based on models that use Census-based measures to relate neighborhood characteristics to child outcomes, may be biased downwards as we are likely capturing characteristics of a much larger area than what people typically

consider to be a "neighborhood"; this larger area likely includes the "neighborhood," but may also include surrounding areas that are not as relevant for children and with which they do not come into contact a great deal.

### *Controls*

In all analyses, we control for an extensive set of background family characteristics. We take advantage of the longitudinal nature of the main file data of the PSID to capture important characteristics of children's families measured over several years, rather than just at a single point in time. This allows us to control for experiences occurring in children's lives that may have influenced their academic outcomes, their parents' choice of neighborhoods, or other important factors. The control measures used are child age, sex, and race (using a dummy variable indicating that the child is non-White); average family income over the child's lifetime; percentage of time during his or her lifetime a child spent in a married-couple family; maternal educational attainment (measured by years of education); and maternal depression. We also control for some measures directly related to the decisions families make about neighborhoods, including an indicator of whether the parent ever moved to a neighborhood to enhance the development of their children, and the percentage of the child's life that their parents owned a home. Additionally, we include a control for perception of neighborhood size, which ranges from the street that the family lives on to an area larger than a 15-minute drive. Means and standard deviations for these measures are presented in Table 1.

To minimize the possibility that patterns of missing values on control variables would bias the analyses and attenuate power, values for control variables were imputed using an expectation maximization (EM) algorithm, which contained all controls, dependent variables, neighborhood factors, and parental perceptions of neighborhoods. Because EM creates a model using the complete cases and uses it to impute expected values for the incomplete cases, we saw this as the best way to include incomplete cases in the analysis while making sure that patterns of missing data did not affect the overall pattern of results. Results comparing the EM data to the nonimputed data did not differ substantively.

## METHOD

Hierarchical linear modeling (HLM; Raudenbush & Bryk, 2002) is used to model the clustering of cases (i.e., children) within larger units (in this case, Census tracts). In these data, each participant is associated with both individual-level (level 1) and neighborhood-level (level 2) characteristics. This variance pattern presents the opportunity to discern which differences in child academic outcomes are attributable to individuals and which are due to neighborhoods. A basic HLM model is comprised of level 1 and level 2 models. The level 1 model (presented in Equation 1) is a within-child model. In this model, the outcome (such as math scores) for child $i$ in neighborhood $j$ is function of child-specific characteristics ($X_{ij}$), as well as parental perceptions of neighborhood cohesion and control:

$$Y_{ij} = \beta_{0j} + \beta_{1j}\,\mathrm{INTEG}_{ij} + \beta_{2j}\,\mathrm{CONTROL}_{ij} + \beta_{3j}X_{ij} + \epsilon_{ij} \qquad (1)$$

In the level 2 model, the average level of math scores ($\beta_{0j}$) within a neighborhood is modeled as a function of community variables ($N_j$) measured at the Census-tract level ($N_j$), as in Equation 2.

$$\beta_{0j} = \gamma_{00} + \gamma_{01} N_j + \mu_{0j} \quad (2)$$

This study uses national data, which have many advantages in terms of representativeness and increased sample size, but have the limitation of a disperse nature of respondents. In the PSID-CDS, 68% percent of the Census tracts contain only one household, 18% contain two households, and 6% have more than three households. This low level of clustering would be problematic in a measurement model, in which the goal was to use a series of items to reliably measure constructs. However, because our data are clustered by neighborhood, all results presented here use HLM, which is the most appropriate method of dealing with such data in a regression model.[4]

Our analysis follows several steps. First, unconditional HLM models are estimated for each of the four outcomes (i.e., no covariates are added). Next, only the four Census factors are included in the models. Then, the parental perceptions of neighborhood cohesion and control are added to examine whether they account for the influence of neighborhood characteristics on children. In the next step, we add individual characteristics that are exogenous to neighborhood influence but are important controls in that they identify people who might select themselves into specific neighborhoods. These characteristics include child age, race, and gender. Finally, we include a wide array of family- and individual-level characteristics that are important controls but are potentially problematic in that they may be influenced by the neighborhood itself. If our estimates of community characteristics are robust to these controls, then we gain more confidence in our estimates of community contributions to youth outcomes. These controls include maternal education, maternal depression, the percentage of the child's life that has been spent in a married-parent family, and family income.

## RESULTS

We first present the results from unconditional models, designed to partition the child academic outcome measures into within and between neighborhood components. Results from these models are presented in Table 2. For reading scores, results show that although the overall mean standardized reading score is significant, showing that scores vary significantly within neighborhoods, the variance components show that reading scores do not vary significantly across neighborhoods ($p = .46$). Similarly, the results show that, for math scores, there is significant variation within, but not between, neighborhoods, as shown by the $p$-values for the intercept and variance components, respectively. Results for the measure of classroom language adaptivity and classroom disruptiveness indicate no significant within-neighborhood variation, but these measures do vary significantly across neighborhoods. These results suggest that we may see a stronger role

[4]The HLM statistical software provides not only HLM estimates but also OLS estimates, with robust standard errors that account for clustering. In comparing these two methods of estimation, we did not find evidence of substantial differences in the patterns of results. Specifically, we observe the same pattern of significance, magnitude, and direction for the estimates of the effects of the four neighborhood factors, as well as for the two measures of parental perceptions of the community environment.

***Table 2. Unconditional Model Results for Measures of Scholastic Success***

| | *Intercept*, $\gamma_{00}$ | | | | *Neighborhood M*, $U_0$ | | | |
|---|---|---|---|---|---|---|---|---|
| | *Coeff.* | *SE* | t *Ratio* | p-*Value* | *Variance* | df | $\chi^2$ | p-*Value* |
| Reading | 0.31 | 0.03 | 11.090 | 0.00 | 0.02 | 677 | 680.05 | 0.460 |
| Math | 0.31 | 0.03 | 11.140 | 0.00 | 0.09 | 677 | 699.60 | 0.266 |
| Classroom language adaptivity | 0.05 | 0.03 | 1.490 | 0.14 | 0.24 | 677 | 1,037.46 | 0.000 |
| Classroom disruptiveness | 0.03 | 0.04 | 0.775 | 0.44 | 0.24 | 677 | 922.71 | 0.000 |

for neighborhood characteristics in predicting classroom language adaptivity and classroom disruptiveness than for the achievement outcomes. However, given that the true structure of the data are individuals clustered in Census-tract areas, techniques that account for the hierarchical structure of the data remain appropriate.

Tables 3 through 6 present the results of HLM analyses of the influence of neighborhood characteristics on measures of school achievement. All independent variables were grand mean centered.[5] The results in every table move from a simple model with just the Census characteristics, then adding the parental perceptions. We then add in exogenous individual characteristics and finally the potentially endogenous variables. As we move across analyses, a measure of model fit, called the deviance statistic, was examined to test whether each of the groups of additional variables are jointly significant in explaining the outcomes. Across all four outcomes, this statistic is consistently significant, suggesting that each additional block of variables makes a significant contribution. The deviance estimates and the associated chi-square tests are presented at the bottom of Tables 3–6.

Table 3 presents the results of analyses for reading achievement. In column 1, the neighborhood measures of racial/family diversity and low SES are negatively associated with reading achievement. Panel 2 shows that parental perceptions of community cohesion have significant positive associations with reading achievement. However, inclusion of parental perceptions does not account for the neighborhood effects previously observed. Controls for child age, gender, and race are added next. Here, the positive influence of cohesion becomes nonsignificant, as does the negative influence of the neighborhood factor of race/family structure, whereas the measure of perceived neighborhood control becomes significant. Column 4 of Table 3 presents estimates after controlling for the full set of covariates. Here, there is no longer a significant association between perceived control and reading scores. However, the effect of low SES status of the community remains significant. Additionally, the effect of immigrant concentration becomes a significant positive predictor of reading achievement. The child characteristics that influence reading achievement are child age, ethnicity, maternal education, and family income.

Table 4 presents the results for math achievement. As shown for reading achievement, living in a community with lower SES status neighbors is associated with lower math scores. In panel 2, perceptions of community cohesion are associated with higher math test scores. Panel 3 of Table 4 includes exogenous individual characteristics. As was shown in the previous table, after the inclusion of these measures, the coefficients for cohesion become

[5]With grand mean centering, independent variables are centered by subtracting each participant's value on the independent variable from the mean of that variable across the mean of all other participants in the sample. When grand mean centering is used, the intercept is interpreted as the predicted score of an individual whose value for that independent variable is equal to the grand mean.

*Table 3. Hierarchical Linear Modeling Estimates: Reading Achievement,* N = *1,419 PSID Children*

| | *1* | | *2* | | *3* | | *4* | |
|---|---|---|---|---|---|---|---|---|
| | *Coeff.* | *SE* | *Coeff.* | *SE* | *Coeff.* | *SE* | *Coeff.* | *SE* |
| Fixed effect | | | | | | | | |
| Intercept, $\gamma_{00}$ | 0.31 | 0.03** | 0.32 | 0.03** | 0.32 | 0.02** | 0.16 | 0.02** |
| Race/family structure, $\gamma_{01}$ | –0.10 | 0.04** | –0.10 | 0.03** | –0.06 | 0.03 | –0.02 | 0.03 |
| Low SES, $\gamma_{02}$ | –0.14 | 0.03** | –0.11 | 0.03** | –0.09 | 0.02** | –0.04 | 0.02* |
| Residential instability, $\gamma_{03}$ | 0.01 | 0.04 | 0.01 | 0.04 | 0.02 | 0.03 | 0.01 | 0.03 |
| Immigrant concentration, $\gamma_{04}$ | 0.00 | 0.03 | –0.01 | 0.03 | 0.03 | 0.03 | 0.05 | 0.03* |
| Cohesion slope, $\beta_{10}$ | | | 0.14 | 0.04** | 0.04 | 0.03 | 0.02 | 0.03 |
| Control slope, $\beta_{20}$ | | | 0.07 | 0.05 | 0.07 | 0.03** | 0.04 | 0.03 |
| Slopes for individual characteristics | | | | | | | | |
| Child's age, $\beta_{30}$ | | | | | 0.29 | 0.01** | 0.29 | 0.01** |
| Child is male, $\beta_{40}$ | | | | | –0.06 | 0.03* | –0.06 | 0.03 |
| Child is not White, $\beta_{50}$ | | | | | –0.20 | 0.05** | –0.13 | 0.05** |
| Maternal education, $\beta_{60}$ | | | | | | | 0.02 | 0.01** |
| Maternal depression, $\beta_{70}$ | | | | | | | –0.01 | 0.00 |
| Time parents married, $\beta_{80}$ | | | | | | | 0.02 | 0.06 |
| Log of income, $\beta_{90}$ | | | | | | | 0.08 | 0.03** |
| Time owned home, $\beta_{10}$ | | | | | | | 0.07 | 0.06 |
| Perception of neighborhood size, $\beta_{11}$ | | | | | | –0.01 | 0.02 | |
| Moved neighborhoods for child, $\beta_{12}$ | | | | | | | 0.04 | 0.04 |
| Measures of model fit | | | | | | | | |
| Deviance (estimated parameters) | 1,980.5 | (7) | 1,952.8 | (14) | 1,298.4 | (17) | 1,263.1 | (24) |
| Model comparison test $\chi^2(df)$ | 36.5** | (4) | 27.7** | (7) | 654.4** | (3) | 35.3** | (7) |

* $p < .05$; ** $p < .01$.

*Table 4. Hierarchical Linear Modeling Estimates: Math Achievement,* N = *1,419 PSID Children*

| | *1* | | *2* | | *3* | | *4* | |
|---|---|---|---|---|---|---|---|---|
| | *Coeff.* | *SE* | *Coeff.* | *SE* | *Coeff.* | *SE* | *Coeff.* | *SE* |
| Fixed effect | | | | | | | | |
| Intercept, $\gamma_{00}$ | 0.31 | 0.03** | 0.32 | 0.03** | 0.32 | 0.02** | 0.32 | 0.02** |
| Race/family structure, $\gamma_{01}$ | –0.05 | 0.03 | –0.05 | 0.03 | –0.03 | 0.03 | –0.01 | 0.03 |
| Low SES, $\gamma_{02}$ | –0.16 | 0.03** | –0.13 | 0.03** | –0.11 | 0.02** | –0.08 | 0.02** |
| Residential instability, $\gamma_{03}$ | 0.00 | 0.04 | 0.02 | 0.04 | –0.01 | 0.02 | 0.01 | 0.02 |
| Immigrant concentration, $\gamma_{04}$ | 0.00 | 0.03 | –0.01 | 0.03 | 0.03 | 0.02 | 0.05 | 0.02* |
| Cohesion slope, $\beta_{10}$ | | | 0.13 | 0.04** | 0.03 | 0.02 | 0.02 | 0.02 |
| Control slope, $\beta_{20}$ | | | 0.07 | 0.05 | 0.06 | 0.03* | 0.03 | 0.03 |
| Slopes for individual characteristics | | | | | | | | |
| Child's age, $\beta_{30}$ | | | | | 0.33 | 0.01** | 0.33 | 0.01** |
| Child is male, $\beta_{40}$ | | | | | 0.04 | 0.03 | 0.04 | 0.03 |
| Child is not White, $\beta_{50}$ | | | | | –0.20 | 0.05** | –0.14 | 0.04** |
| Maternal education, $\beta_{60}$ | | | | | | | 0.02 | 0.01** |
| Maternal depression, $\beta_{70}$ | | | | | | | –0.01 | 0.00** |
| Time parents married, $\beta_{80}$ | | | | | | | 0.01 | 0.06 |
| Log of income, $\beta_{90}$ | | | | | | | 0.05 | 0.03 |
| Time owned home, $\beta_{10}$ | | | | | | | 0.05 | 0.05 |
| Perception neighborhood size, $\beta_{11}$ | | | | | | | –0.03 | 0.12 |
| Moved neighborhoods for child, $\beta_{12}$ | | | | | | | 0.02 | 0.04 |
| Measures of model fit | | | | | | | | |
| Deviance (estimated parameters) | 1,969.0 | (7) | 1,951.3 | (14) | 947.4 | (17) | 902.3 | (24) |
| Model comparison test $\chi^2(df)$ | 34.4** | (4) | 17.7** | (7) | 1,003.9** | (3) | 45.0** | (7) |

* $p < .05$; ** $p < .01$.

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insignificant, while the coefficient for parental perceptions of control becomes significant. In the last panel, the negative influence of living in a low-SES neighborhood remains significant, but parental perceptions of neighborhood control lose significance. Interestingly, again, once the full set of covariates is included, a significant positive influence of living in a community with a higher concentration of immigrants emerges.

Table 5 presents the results of analyses for classroom language adaptivity. In the first model, we observe negative influences for low SES status and racial and familial diversity. In panel 2, perceived cohesion is a significant positive predictor of better language use, and the Census neighborhood variables remain significant. Next, in panel 3, exogenous individual characteristics are included. The negative coefficient for racial and familial diversity is reduced to nonsignificance. Additionally, the positive coefficient on cohesion becomes nonsignificant, but the measure of parental perceptions of control becomes significant. Panel 4 of Table 5 presents results controlling for the full set of covariates. As observed with math achievement, living among more immigrant neighbors is now significantly associated with improved language adaptivity. Additionally, the protective effect of parent-reported control is no longer significant, nor is the negative effect of neighborhood SES.

Table 6 presents the results of analyses of classroom disruptiveness. Lower community SES and residential instability are both associated with more disruptive behavior. Once parental perceptions are controlled, results show in panel 2 that living in a community characterized by higher racial and family diversity is also associated with more disruptive behavior, but neither parental perception measure is associated with classroom disruptive behavior. Panel 3 of Table 6 includes exogenous individual characteristics. Here again, the neighborhood factor of racial and family structure diversity becomes nonsignificant. Additionally, a significant protective influence of neighborhood-level immigrant concentration emerges. In this model, low neighborhood SES and residential mobility continue to have a significantly negative effect on disruptiveness. Finally, in panel 4, the inclusion of the full set of controls reduces the low SES factor to insignificance, whereas immigrant concentration remains negatively associated with disruptive behavior, and residential mobility retains a positive association.[6]

## DISCUSSION

The purpose of this study was to test a model of neighborhood influence on school-aged children that includes both structural conditions and parental perceptions of the neighborhood. The results provide consistent evidence that living in a neighborhood with low-SES neighbors is associated with deficits in both test scores. This is consistent with Chase-Lansdale et al. (1997) and Brooks-Gunn et al. (1993), each of whom tested the influence

[6]As a check for the potential effects of selection bias, we separated the sample into those who had resided in the same neighborhood longer than 3 years and those who had not. This strategy is similar to that used by Turley (2003) and is based on the argument that if the coefficients on the neighborhood factors are truly picking up the influence of living in a certain type of neighborhood, rather than proxying for the type of person who moves to that neighborhood, then these coefficients should be stronger for children who have lived in the same neighborhood for a longer period of time. The results of these additional analyses, using the full model with all covariates added, are shown in Table 4. These results indicate that the detrimental effects of low SES and the benefits of immigrant concentration are only consistently significant for the children whose families have lived in the neighborhood for at least 3 years. We do still find a significant association between low socioeconomic status and math achievement in this subsample of children who have resided in their locations for less than 3 years. These supplemental analyses provide additional support to the overall robustness of the relationships we report in this article.

*Table 5. Hierarchical Linear Modeling Estimates: Classroom Language Adaptivity, N = 909 PSID Children*

| | *1* | | *2* | | *3* | | *4* | |
|---|---|---|---|---|---|---|---|---|
| | *Coeff.* | *SE* | *Coeff.* | *SE* | *Coeff.* | *SE* | *Coeff.* | *SE* |
| Fixed effect | | | | | | | | |
| Intercept, $\gamma_{00}$ | 0.04 | 0.03 | 0.05 | 0.03 | 0.05 | 0.03 | 0.05 | 0.03 |
| Race/family structure, $\gamma_{01}$ | –0.19 | 0.04** | –0.19 | 0.04** | 0.00 | 0.05 | 0.03 | 0.05 |
| Low SES, $\gamma_{02}$ | –0.13 | 0.04** | –0.11 | 0.04** | –0.12 | 0.04** | –0.04 | 0.04 |
| Residential instability, $\gamma_{03}$ | –0.02 | 0.05 | 0.00 | 0.05 | –0.03 | 0.04 | 0.00 | 0.04 |
| Immigrant concentration, $\gamma_{04}$ | –0.02 | 0.04 | –0.02 | 0.04 | 0.05 | 0.04 | 0.14 | 0.04** |
| Cohesion slope, $\beta_{10}$ | | | 0.10 | 0.05* | 0.06 | 0.04 | 0.01 | 0.05 |
| Control slope, $\beta_{20}$ | | | 0.10 | 0.05 | 0.11 | 0.05* | 0.07 | 0.05 |
| Slopes for individual characteristics | | | | | | | | |
| Child's age, $\beta_{30}$ | | | | | 0.02 | 0.01 | 0.02 | 0.01 |
| Child is male, $\beta_{40}$ | | | | | –0.24 | 0.06** | –0.23 | 0.06** |
| Child is not White, $\beta_{50}$ | | | | | –0.43 | 0.08** | –0.33 | 0.08** |
| Maternal education, $\beta_{60}$ | | | | | | | 0.08 | 0.01** |
| Maternal depression, $\beta_{70}$ | | | | | | | –0.01 | 0.01* |
| Time parents married, $\beta_{80}$ | | | | | | | –0.05 | 0.11 |
| Log of income, $\beta_{80}$ | | | | | | | 0.04 | 0.06 |
| Time owned home, $\beta_{10}$ | | | | | | | 0.14 | 0.10 |
| Perception of neighborhood size, $\beta_{11}$ | | | | | | | 0.02 | 0.04 |
| Moved neighborhoods for child, $\beta_{90}$ | | | | | | | 0.03 | 0.07 |
| Measures of model fit | | | | | | | | |
| Deviance (estimated parameters) | 2,109.2 | (7) | 2,097.0 | (14) | 2,050.6 | (17) | 1,998.0 | (24) |
| Model comparison test $\chi^2(df)$ | 52.9** | (4) | 12.2 | (7) | 46.4** | (3) | 52.6** | (7) |

* $p < .05$; ** $p < .01$.

*Table 6. Hierarchical Linear Modeling Estimates: Classroom Disruptiveness,* **N** *= 909 PSID Children*

| | *1* | | *2* | | *3* | | *4* | |
|---|---|---|---|---|---|---|---|---|
| | *Coeff.* | *SE* | *Coeff.* | *SE* | *Coeff.* | *SE* | *Coeff.* | *SE* |
| Fixed effect | | | | | | | | |
| Intercept, $\gamma_{00}$ | 0.03 | 0.04 | 0.03 | 0.04 | 0.03 | 0.03 | 0.02 | 0.03 |
| Race/family structure, $\gamma_{01}$ | 0.14 | 0.05 | 0.14 | 0.06* | –0.02 | 0.07 | –0.08 | 0.07 |
| Low SES, $\gamma_{02}$ | 0.11 | 0.04** | 0.11 | 0.04** | 0.11 | 0.04** | 0.08 | 0.04 |
| Residential instability, $\gamma_{03}$ | 0.15 | 0.06* | 0.17 | 0.07* | 0.20 | 0.06** | 0.14 | 0.06* |
| Immigrant concentration, $\gamma_{04}$ | –0.07 | 0.04 | –0.08 | 0.05 | –0.14 | 0.05** | –0.25 | 0.05** |
| Cohesion slope, $\beta_{10}$ | | | –0.04 | 0.05 | –0.02 | 0.05 | 0.06 | 0.05 |
| Control slope, $\beta_{20}$ | | | –0.02 | 0.07 | –0.03 | 0.07 | 0.01 | 0.07 |
| Slopes for individual characteristics | | | | | | | | |
| Child's age, $\beta_{30}$ | | | | | 0.02 | 0.02 | 0.02 | 0.02 |
| Child is male, $\beta_{40}$ | | | | | 0.40 | 0.07** | 0.38 | 0.06** |
| Child is not White, $\beta_{50}$ | | | | | 0.33 | 0.10** | 0.20 | 0.10* |
| Maternal education, $\beta_{60}$ | | | | | | | –0.05 | 0.02** |
| Maternal depression, $\beta_{70}$ | | | | | | | 0.01 | 0.01 |
| Time parents married, $\beta_{80}$ | | | | | | | –0.30 | 0.13* |
| Log of income, $\beta_{80}$ | | | | | | | 0.03 | 0.07 |
| Time owned home, $\beta_{10}$ | | | | | | | –0.26 | 0.12* |
| Perception of neighborhood size, $\beta_{11}$ | | | | | | | –0.12 | 0.04** |
| Moved neighborhoods for child, $\beta_{90}$ | | | | | | | –0.05 | 0.08 |
| Measures of model fit | | | | | | | | |
| Deviance (estimated parameters) | 2,343.0 | (7) | 2,334.3 | (14) | 2,285.0 | (17) | 2,238.6 | (24) |
| Model comparison test $\chi^2(df)$ | 37.2** | (4) | 8.7 | (7) | 49.38** | (3) | 46.4** | (7) |

* $p < .05$; ** $p < .01$.

of a wide range of neighborhood characteristics on children, and found that neighborhood economic status was most consistently associated with child well-being. Their analyses focused on young children, and the current study confirms that this association also holds true for older children. Our results also indicate that for measures of classroom behavior, the influence of living in a low-SES neighborhood on children is reduced to insignificance in model four, with the inclusion of the full set of covariates. This suggests that it may not be the SES of the neighborhood, but rather the individual circumstances of the children living there, that are most important when predicting children's behavior in the classroom. In additional analyses, we found that it is not one single individual characteristic but the overall set of individual characteristics that causes the SES factor to become insignificant in the final models.

Rather than signaling a scenario in which social capital is likely to be diminished when neighbors have a dissimilar background, the results indicate that living in a community with higher levels of immigrants is associated with improved classroom behavior and test scores. These findings lend support to the idea that communities with many immigrants represent a concentration of individuals whose immigration experience proxies for a constellation of factors, such as organization and motivation, that ultimately translate into an environment where education is valued as a marker of adjustment to the United States. These findings are also consistent with other research showing that immigrants hold educational success to be very important goals for their offspring. For example, Rauh et al. (2003) found positive effects of living in an immigrant community on third-grade reading achievement scores and have interpreted their findings as evidence of a setting that promotes learning and behaviors, such as positive classroom language adaptiveness, leading to school success. We know of no other research that has examined the role of immigrant concentration in influencing children's academic achievement with national data; thus, these results point the way for more work in this area.

Throughout these analyses, we observe that the beneficial effect of immigration concentration emerges only after controlling for other important covariates. Results (not shown) suggest that maternal education suppresses the effect of immigrant concentration on children's test scores. Specifically, children who live in neighborhoods with larger concentrations of immigrants tend to have mothers who have lower levels of education, and low maternal education is negatively associated with reading and math scores. Consequently, in models that do not control for individual characteristics, the positive effect on immigrant concentration on test scores is biased downwards and subsequently suppressed. For classroom language adaptivitity and disruptiveness, multiple factors serve to suppress the positive effect of the immigration factor in earlier models.[7]

Our results also indicate that living in a neighborhood with greater residential instability is associated with increased classroom disruptiveness, but not with other child outcomes. Perhaps movement of children in and out of the school system promotes more disruptiveness. Family migration (Hagen, MacMillan, & Wheaton, 1996) may disrupt community social capital and lead to negative effects on adolescent educational outcomes. Finally, a particularly interesting finding is that the measure of neighborhood racial and

[7]Maternal education, home ownership, and marital status are all negatively correlated with immigrant concentration and positively correlated with classroom language adaptivity. Maternal depression is positively correlated with immigrant concentration and negatively correlated with classroom language adaptivity. Once these measures are controlled, a positive association between living in a neighborhood with a higher concentration of immigrants and classroom language adaptivity emerges. Finally, when looking at classroom disruptiveness, both the race and gender of the child serve to suppress the influence of immigrant concentration in earlier models.

family structure diversity is consistently associated with lower test scores and worse classroom behavior; but this is only when individual characteristics of children and their families are not controlled. After these are controlled, there is no association between living in a more diverse neighborhood and academic outcomes. This suggests that the race and family structure characteristics of neighbors do not exert a unique influence on children, beyond their own family characteristics.

In this research, we find a limited role for the predictive power of parental perceptions of the neighborhood for children's school outcomes. All of the initial significant effects of perceptions of social cohesion and control become nonsignificant once individual and family characteristics are accounted for in the models. This finding is similar to other recent research by Wen, Hawkley, and Cacioppo (2004), who find that perceptions of neighborhood quality are reduced to insignificance when individual-level controls are added. We also do not find any evidence that parental perceptions of integration or control account for the influence of neighborhood characteristics on children's academic outcomes. There are likely explanations for the lack of consistent significant associations between parental perceptions and youth outcomes. First, our measures may not be finely measured enough to detect significant effects that might truly be present in our data. Second, we use parental perceptions of community characteristics; information on the child's perception of the community might generate findings that are more significant. Unfortunately, these data were not available.

It should be noted that a limitation to these analyses is that school contextual information was not available. Inclusion of school-level characteristics, such as level of school funding, could provide important information about other potentially important influences on child scholastic success that are correlated with neighborhood quality.

Together, this study makes several contributions to the literature examining the influence of neighborhood conditions on children. First, we focus on an understudied age group. Second, we examine the influence of both objective and subjective measures of the neighborhood, finding that objective measures play a more powerful role in shaping children's academic achievement. Finally, we examine a wide range of both neighborhood measures and child outcomes. We find that, in general, measures of parental perceptions are not consistent predictors of achievement and classroom behavior in middle childhood. In contrast, living in a community with low-SES neighbors is associated with lower achievement. Perhaps the most suggestive finding is the protective association between living in a community with a higher concentration of immigrant neighbors and measures of classroom achievement and behavior. These findings suggest, at the very least, an important avenue for future research in the area of community contributions to scholastic success.

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